

INTRODUCTION

The 2008 Water Quality Assessment Integrated Report presents a summary of the water quality conditions in Virginia from January 1, 2001, through December 31, 2006. The Virginia Department of Environmental Quality (DEQ), with assistance from the Virginia Department of Conservation and Recreation (DCR), develops and submits the report to the U.S. Environmental Protection Agency (EPA) and the U.S. Congress every even-numbered year. The report satisfies the requirements of the U.S. Clean Water Act (CWA) Sections 305(b) and 303(d) and the Virginia Water Quality Monitoring, Information and Restoration Act (WQMIRA) § 62.1-44 19:4 through 62.1-44-19.8 of the Code of Virginia.

The objectives of Virginia's water quality assessment program are to determine whether waters meet Water Quality (WQ) Standards and the designated uses of those waters according to the WQ Standards. There are six designated uses which may be applicable to surface waters: aquatic life, fish consumption, shellfish consumption, swimming, public water supplies (where applicable), and wildlife. Additionally, several new subcategories of aquatic life use were adopted in 2005 for estuarine waters of the Chesapeake Bay and its tidal tributaries. The WQ Standards define the water quality needed to support each of these uses. If a waterbody contains more pollutants than allowed by the WQ Standards, it will not support one or more of its designated uses. Such waters are considered to have "impaired" water quality.

Both human (anthropogenic) activities and natural processes can cause impaired water quality. All anthropogenic impaired waters in Virginia are placed on a federally mandated 303(d) impaired waters list. Waters that are impaired due to human activities and associated pollutants require a plan to restore water quality and associated designated use(s). DEQ schedules each of these waters for development of a Total Maximum Daily Load (TMDL), which is a reduction plan that defines the limit of a pollutant(s) that water can receive and still meet WQ Standards. A TMDL Implementation Plan is developed after a TMDL is approved by EPA. Once fully implemented, the TMDL Implementation Plan will restore the impaired waters and maintain its water quality.

The EPA wants states to fully integrate two reports required under different sections of the CWA. Section 305(b) requires states to submit a report on all information regarding its waters, and Section 303(d) requires a list of waters with impaired water quality. The 2004 water quality assessment was the first one published by Virginia to combine both reports.

Significant Changes and Additions to the 2008 Water Quality Assessment Integrated Report

In 2003, EPA developed five main categories, with several subcategories, for rating all surface waters. For the 2006 report, Virginia further subcategorized certain EPA categories to facilitate follow-up monitoring and other agency tracking needs. Additional subcategories were added in 2008 to track the conditions of waters with adopted TMDLs. Information regarding this new categorization scheme and other associated assessment methodologies can be found in Chapter 2.2 of this report or in the 2008 Assessment Guidance Manual found on the DEQ water website at <http://www.deq.virginia.gov/wqa/guidance08.html>.

In an on-going effort to increase assessment accuracy, Virginia re-calculated the sizes of its lakes and reservoirs. For the 2008 assessment, there were size changes in lakes and reservoirs due primarily to an increase in accuracy resulting from the use of high-resolution US Geological Survey National Hydrography Data and Geographic Information Systems (GIS).

Also for 2008, DEQ has moved from a five-year assessment data window to a six-year window. This change follows an update to the ambient water monitoring strategy for Virginia, which has incorporated all 1,247 12-digit (6th Order) sub-watersheds into the existing rotating watershed monitoring approach. This approach uses a two-year, semi-monthly monitoring scheme, as described in Chapter 2.1, prior to rotating to another sub-watershed. This approach is designed to cover one-third of these smaller sub-watersheds throughout the state every two years. Thus, after six years, almost every sub-watershed within the state is scheduled to be monitored. This is the first assessment report to fully reflect this updated watershed rotation scheme.

New Water Quality Standards for dissolved oxygen (DO) and submerged aquatic vegetation (SAV) in the Chesapeake Bay and its tidal tributaries were adopted and assessed for the first time in the 2006 Water Quality Assessment Integrated Report. Additional refinements have been added to the Bay Standards based

on the recently released 2007 Chesapeake Bay Criteria Addendum. The 2008 assessment results found in Chapter 6.7 are based on the current protocols and associated criteria including dissolved oxygen (including site-specific criteria for the Mattaponi and Pamunkey Rivers) as well as chlorophyll *a* for the James River and water clarity associated with SAV assessments.

For the 2008 report, an analysis of Virginia's freshwater probabilistic monitoring (Probmon) program has been included in Chapter 2.4. This analysis provides a statistically supported statewide snapshot of water quality and the predominant sources of water quality problems. As part of this on-going free-flowing probabilistic monitoring study, stream habitat is being analyzed to determine if benthic habitat is being negatively affected.

Public beaches have once again been assessed and included in the 2008 report. In 2002, under amended Section 303 of the Federal Water Pollution Control Act (33 U.S.C. 1313 -Beaches Environmental Assessment and Coastal Health (BEACH) Act), the Virginia Department of Health (VDH) Office of Epidemiology initiated the Virginia BEACH Monitoring Program. The data collected by VDH during the 2008 reporting period has been provided to DEQ and included in the overall water quality assessment of state waters for primary contact recreation designated use. See Chapter 2.1 (BEACH Monitoring Program) for more information on the monitoring and assessment of Virginia's beaches.

Data Used To Determine Water Quality

There are two types of water quality data used in the assessment process. The first type is "monitored" data approved through the quality assurance/quality control process (QA/QC). The data come from stream monitoring—the collection and analysis of chemical, biological, and physical samples taken by DEQ and any other DEQ-approved data. These data are considered of the highest quality. Normally, the U.S. impaired waters list for the entire United States is determined using only QA/QC-approved monitored data. Monitored data are obtained using EPA-accepted methods and DEQ-approved protocols. All non-DEQ monitoring data submittals used in an assessment, except chemical data submittals from the U.S. Geological Survey (USGS), must include a sampling and analysis protocol and all field data for DEQ review.

The second type of data used in the assessment is considered "evaluated" data. These physical, chemical, and biological data are primarily obtained from sources without an EPA-approved or DEQ-accepted sampling protocol. These data are considered to be of lower quality than the monitored data with minimum confidence in their results. Normally, these data are not used directly for listing waters as impaired but may be used to identify observed effects that may trigger additional follow-up monitoring. As in previous reports, waters that were on previous impaired waters lists but do not have any additional monitoring data for the 2008 assessment period will reflect the results of the previous assessment.

Planning though 2010 and Beyond

Equally important for assessments in the future is the increased inclusion of non-DEQ water quality data from citizen groups, private businesses, and other government agencies. While quality assurance and quality control (QA/QC) continues to be a concern for direct use of outside data, DEQ is making a considerable effort to improve the data quality of outside providers by reviewing monitoring protocols and suggesting means for improving data quality. Our objective is to certify additional non-DEQ QA/QC data, with the consent of contributors, for future designated use determination in the overall statewide water quality assessment.

For more information relating to water quality programs and initiatives visit the DEQ web site at www.deq.virginia.gov/wqa